The Relationship of Alienation and Piagetian Concepts in Nursing the Diabetic Child

By

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To

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THE RELATIONSHIP OF ALIENATION AND PIAGETIAN
CONCEPTS IN NURSING THE DIABETIC CHILD

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This study was designed to explore the relationship between thinking (concrete or abstract) and alienation (self-estrangement) in children with diabetes and the children's record of hospitalizations.

It was hypothesized that children who were concrete thinkers (present-oriented, not understanding cause and effect) would be hospitalized more often than those who were abstract thinkers (future-oriented, understanding cause and effect) and that those who were alienated (externally oriented) would be hospitalized more frequently than those who were not alienated (internally oriented).

One hundred and fifty-two children were involved in the study, ranging in age from 8 through 15 years. Eighty-two of them served as a pilot study for the development of the Abstract Slide Test (AST). This test consisted of four colored slides depicting common aspects of diabetic care. The responses to slides were judged as abstract or concrete. The child was judged as concrete if all slides were answered concretely; otherwise he was judged as abstract.

Seventy of the children took the Embedded Figures Test (EFT), a timed test of figure ground differentiation, to establish levels of alienation (external orientation).

There was no statistically significant relationship between the two tests with a point biserial correlation.

The null hypotheses of no difference in rate of hospitalizations between the alienated and the not alienated by sex could be rejected at the .05 level with a point biserial correlation for both the boys and the girls.

The number of hospitalizations was obtained from each child's medical history for the two years preceding the study.

The null hypotheses of no difference in the rate of hospitalization between concrete and the abstract thinkers by sex could be rejected at the .05 level with a Fisher exact probability test for the girls but not for the boys.

Overall, 75 percent of the girls had the expected behavior in relationship to the abstract/concrete dimension and hospitalization, but only 70 percent of the boys had the expected behavior in this area.

It was concluded that the hospitalized children were more concrete and more alienated. The more abstract and less alienated children were hospitalized less frequently than the concrete and more alienated. It was possible to predict which children would have problems controlling their diabetes from their abstraction and/or alienation levels.

CHAPTER I

INTRODUCTION TO THE STUDY

One of the many problems continually confronting the pediatric nurse is the child with diabetes. Each year an ever increasing number of children are diagnosed as diabetic.

Since children can be diagnosed at any age, both "new" and "old" diabetic children may be found in any school grade from kindergarten through high school.

And, of course, such children are met in all areas of nursing--public health, office, school, hospital, industrial. In education it is necessary to understand the problems involved in order to teach these children most effectively. In nursing it is necessary to understand the process involved in order to teach the children--and their parents--how to function at their optimum level. In nursing education it is necessary to understand both the process and the problems in order to teach nursing students how best to care for and help educate the child with diabetes.

Unfortunately, many diabetics--both children and adults--seem almost incapable of maintaining themselves in as healthy a state as possible. Why do they lapse from their diets? "Cheat" on their insulin? Refuse to exercise? Their inability to cope doesn't seem to be a function of intelligence or to be entirely emotionally based.

With the repeatedly hospitalized patient, no teaching approach seems to have been effective overall. No member of the health professions has yet succeeded in reaching these individuals with any degree of consistency. Some people will say that these patients are self-destructive, emotionally blocked, unable to respond adequately.

Is it not possible that the diabetic repeater thinks differently? Not that his intelligence is less, but that he views things from a different angle?

Perhaps these repeatedly hospitalized children do think differently. Perhaps they are more externally oriented, more alienated, more concrete. If they do have a different approach--concrete, alienated, external--an approach that can be identified, then nursing will be in a better position to devise newer educational programs for them. Identifying a patient's approach to his disease must precede helping him change his approach--or at least understand it.

Are concrete thinking, alienation, and frequency of hospitalization related?

Purpose of the Study

The purpose of this study was to test the hypothesis that diabetic children who have repeated problems in controlling their disease think differently from diabetic children who do not have these problems and do not have the same external-internal control orientation.

Levels of concrete thinking and the degree of alienation present in the children were identified and tested. The figures obtained were

correlated with the number of the child's hospitalizations during the last two years. An attempt was made to relate this information to possible educational programs or processes to help those children most frequently hospitalized.

Questions for Study

This study sought to find answers to the following questions:

1. Is there a difference in the level of concrete thinking in children with poorly controlled diabetes?

2. Is there a difference in the amount of external control these children believe in?

3. Can testing yield significant differences between well-controlled and poorly controlled diabetic children?

Delimitations of the Study

This study was delimited to 82 children who attended the local camp for children with diabetes in 1969; 40 children who attended the same camp in 1970; 28 children from the Chicago area who had not attended a camp; and one set of identical twins from St. Louis who also had not attended a camp.

All of the participants were volunteers. All were between 9 and 15 years of age. There were 80 girls and 72 boys. No attempt was made to achieve a better balance between white and black because of the small number of black children available at the time. Of the children, 133 were white, 19 were black.

Basic to these delimitations were certain limitations which will be dealt with later. (See Chapter IV, Analysis and Interpretation of Data.)

Definition of Terms

For the purposes of this study these definitions were used.

Alienation.--Self-estrangement to the degree that behavior depends upon future rewards, or upon rewards that are not a part of the behavior itself, or upon external rewards.

Concrete.--Thinking that is present-oriented and guided by external cues; by that which is observable; by an inability to anticipate; to understand cause and effect; or to differentiate figure from ground.

Abstract.--Thinking that is future-oriented and guided by hypothetical or deductive reasoning; by internal cues; by an ability to anticipate, to deal with potentials, to understand cause and effect, and to differentiate figure from ground.

Controlled diabetes.--Not hospitalized during the two years preceding the study for diabetic problems arising from failure to follow recommended practices of diabetic management.

Need for the Study

Although nursing and medicine have been concerned about diabetic children for many years, little interest has been shown in the cognitive or "thinking" mechanisms which may contribute to the child's ability or inability to handle his illness.

The patterns in a child's thinking must certainly affect the way he views and reacts to an illness. There is a need to investigate the relationship of a child's thinking (not his intelligence) to his handling of illness. Awareness of this relationship can enable nurses to formulate different--and, hopefully, more effective--nursing programs for the ill child.

CHAPTER II

REVIEW OF RELATED LITERATURE

Although the literature overlaps, two major areas of research can be identified: (1) Piagetian concepts; and (2) alienation and internal-external control orientation.

Piagetian Concepts

Piaget has stressed the stages of cognitive development from the sensory-motor to the abstract. Though the stages are ordinal rather than interval, the young child is rarely capable of true abstract thought, and the older child is not usually animistic.

The stages:

1. Pre-operational (egocentric, irreversible, animistic, unstable, transductive).
2. Concrete (present-oriented, reversible, stable, logical, real rather than potential).
3. Abstract (potential rather than real, future-oriented, propositional, hypothetico-deductive).

If a child cannot visualize what can be, but only what is--in a very concrete way--how can he visualize the results of his actions upon his illness? If he feels all right in the quite real concrete present, can he project his thinking into the abstract future and see himself after eating candy or skipping his insulin?

The more concrete thinking, the more present-oriented the individual (15), the less capable he is of understanding probability or

multiple causality (4), the more likely to be confused by perceptual cues (10), and the more difficulty he has acting upon or in accordance with his perceptions (19).

Greater concreteness involves simpler cognitive structure, poorer differentiation, greater dependence on external cues, less ability to change set, poorer delineation between means and ends, poorer capacity to think and act in terms of a hypothetical situation, and a less intrinsically anchored self--and so a lessened understanding of the self as a causal agent in environmental transactions (11).

Such concreteness might possibly explain the inability of the chronically ill child to understand the effect of his own behavior upon his illness. His inability to hypothesize, to change set, to depend upon external cues from others in evaluating his behavior--all these things might determine his attitude towards his disease.

Finding the right combination of "means" to attain a specific "end" is a different process in an adolescent (who can understand possibilities), a ten-year-old (who has a single system), and a five-year-old (who relies upon a subjective perception). The internal action structure has to be inferred from the external performance (6:228).

Piaget found that children linked events together on the basis of some personal interest, not by the real order of time (27).

Unable to anticipate events, the child cannot develop foresight (32). Although able to understand the concept of chance by the age of seven or eight, the child may still, at eleven or twelve, believe in moral causality, or that things happen because they have to (29).

The child may believe in expiatory punishment as the only way to atone for his errors or his transgressions against external rules. His behavior responds more to the punishment than to the results of his actions (28).

He may confuse time and space, may equate age with size, may understand that one thing is older than another, yet not grasp the idea of order, or that the older appeared before the younger (26,31).

A diabetic child who does not really understand time, space, or causality, who believes things happen because they must, who relies on punishment rather than the results of his actions to modify his behavior, will surely react to his illness differently and behave differently from a child who does understand the concepts.

If he cannot grasp the idea of order, how can he understand cause and effect, how can he develop any logical view of his actions and the results of his actions?

Language is also involved in a child's problems. A child may use a term correctly in context, yet not understand either the term or its conceptual basis. Comprehension depends upon the cognitive stage, e.g., concrete or abstract. A concrete child or an abstract child may each use such a term as "brother" correctly, although their comprehension differs. As Sigel explains (35)--the concept of brother cannot be understood until a child can deal with reciprocal relationships.

Young children define brother without any relational terms. Such definitions are not a matter of vocabulary but of immature cognitive processes. Sigel finds children unable to define "brother" in terms of a common reciprocal relationship before the fourth or fifth grade (35:475). Reciprocal relationships in terms of his illness may also elude the child.

Piaget says a child can receive valuable information via language or education, only if he is at a stage where he can understand the information (30).

At first, concrete operations are irreversible. The child cannot anticipate results and is guided by perceptual cues. Gradually his intellectual operations become reversible and more elaborate, developing into hypothetico-deductive formal operations (20). Bruner (1) feels such elaboration occurs as the result of new relationships with the external world. Thus, when the preoperational child is pressured to become more independent and to manipulate objects without help--concrete operations emerge. The child at the stage of concrete operations learns to manipulate facts (outside his imagination) only when subjected to new pressures from without that demand formal abstract thinking.

And so the child moves from a perceptual to a more conceptual point of view. He becomes more highly differentiated and less dependent upon external cues.

As Wohlwill states: ". . . much of Piaget's work on the development of concepts . . . is interpretable in terms of the increasing stability of concepts in the face of the (irrelevant) changes in the stimulus field"(38:472).

Wohlwill has identified three dimensions of the perceptual-conceptual relationships. As one proceeds from the perceptual to the conceptual end of the continuum, the amount of redundant information required decreases, the amount of irrelevant information that can be tolerated without affecting responses increases, and the spatial and

temporal separation over which the stimulus field information can be integrated increases. These three dimensions: redundancy, selectivity, and contiguity comprise specificity. Specificity ranges from the individual inaccurate perceptual judgments to the more accurate products of conceptual processes (38:484).

At the perceptual level, redundancy is basic to figure-ground differentiation; at the conceptual level, redundancy is reduced to an absolute minimum (typically zero in the symbolic mathematical and logical relationships).

At the perceptual level, selectivity is limited with little ability to dissociate relevant from irrelevant cues; at the level of conceptualization, formation of classes requires a systematic selective abstraction of relevant (i.e., criterial) from irrelevant information--this is also true in logical inference, deductive reasoning, problem-solving, and other symbolically mediated behavior.

One of the major developmental changes that seems to take place in the formation of abstract concepts is precisely this differentiation of relevant from irrelevant (but more readily discernible) cues.

At the perceptual level, spatial and temporal contiguity play a major role--but the factor of spatial proximity seems to decrease with age. At the conceptual level the individual can deal with components of stimulus information that are widely separated in space and time.

In the perception of causality, children--but not adults--require a perceived contact between the objects in order for them to appear as causally related. This might also be true of psychological

causality, or causality other than the obviously physical. A child may not be able to see the related causality when he becomes ill today because of an action yesterday.

Kendler and Kendler (14) found inferential reasoning in small children to be closely related to the temporal sequence, or the order, in which the separate steps in the chain of inference were presented. The temporal order between two events was independent of the temporal interval separating them. It is not known if this ordinal factor also decreases with age. Again, this may also be true of the psychological events or the sequence of events in illness. If something intervenes between cause and effect events in illness, perhaps the child cannot see these events as related. Perhaps he may lose the sequence. This could be important in the many sequential events involved in diabetic episodes, for instance.

While children of greatly varying cultural and socio-economic backgrounds appear to arrive at the level of concrete operations at about six or seven years of age, the later attainment of formal operations appears to be much more subject to socio-culturally determined factors. And Elkind (5:333) therefore feels the years from six to twelve are the crucial ones for developing later intellectual achievements of the Piagetian type.

Somewhere around ten or eleven years of age (differing with different children and different situations) children become aware that their concrete operations no longer serve in answering many questions. Searching for new methods, the child slowly begins to manipulate statements about things instead of the things; to hypothesize and work

out what would happen if his hypotheses were true. He can now deal with the merely possible (17,18). He can now operate not only with actions and things, but with relationships between actions and things.

Of course, the ability to manipulate relationships and perform formal operations is necessarily dependent upon the child's manipulations on the concrete level. If he cannot operate upon concrete objects, he will not be able to operate upon abstract relationships.

As Wohlwill claimed (38:485), the differentiation of relevant from irrelevant cues is one of the developmental changes apparent in abstract operations. This differentiation, reflected in the cognitive style of the individual, has been shown to be remarkably stable over the years for the involved individual.

The ability to differentiate or articulate experience increases appreciably from preadolescence to adulthood. Gardner (7) found little difference in such cognitive behaviors in relationship to sex. Goodnow (8) found cognitive development in children independent of environmental factors.

Such field independence (ability to view the parts of a field as discrete) increases until the age of seventeen (37:292), then does not change from seventeen to twenty-four. Children, in the Witkin study (37), showed remarkable relative stability in the extent of their field dependence, even over fourteen years of age.

These individuals of limited differentiation also showed limited differentiation in their experiencing of their bodies. Just as they rely upon the surrounding field in perceiving an object within it, they

also tend to rely upon the social context in which they find themselves in defining "self." There is a lack of a developed sense of a separate identity (36:391).

Although the growth of field independence is developmental in nature, the lack of development, of differentiation abilities, or an uneven development is more interpersonal and environmental.

Field-dependent people are generally more externally oriented than the field-independent. They rely upon the field to define objects within it and upon their personal social field to define themselves.

Alienation and External Control

Alienation has been defined in many ways by the different sciences. In this study the word is used in the sense of being self-estranged--self-estranged to the degree that behavior depends upon future rewards, or rewards that are not part of the behavior itself, or external rewards.

The more dependent the behavior is on rewards outside the activity itself, the greater the self-estrangement (34:790).

Is the diabetic child alienated in his thinking? Does he do what he knows he has to do merely to please others? Or because he knows what will happen to him if he doesn't--in terms of his disease? If rewards are external--or if they are seen as external--will not the punishment also be seen as external?

Individuals vary in their beliefs about external-internal control. They may feel their own actions produce the reinforcements that follow. Or they may feel such rewards and punishments are

controlled by others. The same reinforcement in the same situation may be viewed by one individual as within his control, and by another as outside his influence.

Children feel more helpless or externally controlled in the face of punishment or failure for a longer time than they do in the face of reward or success. Their beliefs in external or internal control are pretty well established by the third grade (3).

Internal-external orientation may be related to parental attitudes. Katkovsky, et al. (13) found children's beliefs in internal control positively associated with parental attitudes which were characterized as warm, praising, protective, and supportive and negatively associated with parental behaviors such as dominance, rejection and criticism.

Many researchers have studied the effects of an external/internal locus of control and the dependency or independency of the child. Julian and Katz (12) found the externally oriented individual to be less concerned with his own performance. And Crandall, et al. (3) felt that young children, being more dependent upon others, are more externally oriented.

Interestingly, a study by Crain, Sussman and Weil (2;39) has shown that diabetic children tend to be more dependent upon their parents than their non-diabetic siblings are, to have a lower level of aspiration, and to be more pleased with their own achievements.

Konstadt and Forman (16) have shown that disapproval has a differentiating effect upon the field-dependent and the field-independent individuals, distinguishing between those who rely upon external

definition of situations and those who have a more internal frame of reference. Field-dependent children paid more attention to the human environment and were more influenced by adult responses to their behavior. They required a more favorable emotional environment in order to function effectively.

In Russia it is believed that self-discipline can only come from obedience, not from independence. Children are taught to be obedient by means of punishment, usually by withdrawal of love (21).

This is a practice adults often follow when dealing with sick children who don't always do as they are told. And yet this is an externally oriented approach.

Such an external orientation is alienating in nature. The child is not helped to develop abilities in abstracting, in hypothesizing, in understanding causality.

Obviously a child who is externally oriented, field-dependent, and concrete in his thinking differs from a child who is capable of abstract thought, more field-independent, and less externally oriented.

If these children happen to be diabetic, will their differences be reflected in their ability to handle their illness?

Will the more externally oriented, concrete thinking child rely more upon adult authority to define his problems with his diabetes? Will he be able to project himself into the future and understand cause and effect in relationship to his own actions? Will he be able to hypothesize outcomes? Can he internalize the teachings and knowledge which he can understand on another level? Can he maintain himself in as healthy a state as possible, or will he be repeatedly ill because external control of his behavior did not intervene in time?

The latter would appear a logical consequence of such thinking and orientation, but nothing specific seems to have been done in this area of research.

Piaget has shown that children cannot understand causality without a concept of time (succession and duration of events); (22,23) that hindsight is evident before foresight; (33) that the young child's belief in a conclusion depends upon his belief in the premises involved; (25) and that until 11 or 12 years of age a child feels he can have no illusions about himself for he knows himself perfectly (24).

Summary

In summary, the literature reviewed indicates that:

1. The more dependent a behavior is on rewards outside the activity itself, the greater the alienation.

2. Concreteness involves poorer differentiation, greater reliance on external cues, a present--rather than future--orientation.

3. Children require spatial proximity, a perceived contact between objects, in order to see them as causally related.

4. Temporal order of events is also important in an understanding of causal relationships.

5. Field-independence and differentiation increase with age, but individual patterns remain quite stable over the years.

6. Field-dependent people rely upon the external field to define both objects and self. And they are more influenced by adult responses to their actions.

CHAPTER III

DESIGN OF THE STUDY

This study was designed to explore the relationships between thinking and alienation in children with diabetes and the number of times these children were hospitalized for problems related to their diabetes.

The overall hypothesis yielded three null hypotheses to be tested:

Hypothesis I — There is no difference in the number of hospitalizations of the children who think abstractly and those who think concretely.

Hypothesis II — There is no difference in the number of hospitalizations of the children who are alienated and those children who are not alienated.

Hypothesis III — There is no relationship between the level of abstraction and alienation.

Data were obtained in three ways. A thematic apperception test, consisting of four colored slides depicting different facets of diabetic care, was used to determine the presence of abstraction in the child's thinking. (See Appendix A for Abstract Slide Test.) The Embedded Figures Test was administered to measure alienation in the external-internal control sense or the ability to differentiate. The number of hospitalizations or days sick was obtained by checking the child's medical history for the past two years.

Selection of Participants

One hundred and fifty-two children were involved in this research. They ranged in age from 8 through 15 years. Eighty-two of the children served as a pilot study for the development of the Abstract Slide Test. Seventy of the children received the Embedded Figures Test. Of these 70 children, 27 received only the Embedded Figures Test, the remaining 43 also received the Abstract Slide Test.

Thirty of the children who received both tests were not attending camp when tested nor had they attended any camp before this time. All the other children were tested while attending camps for children with diabetes.

Not all of the children who attended camp were available for testing and random selection proved to be impossible. The participants were selected on a voluntary basis with an attempt made to maintain some degree of balance between the sexes and between the different age groups. Because of the small number of black children available, no attempt was made to achieve a better balance in this area. One set of 9-year-old identical twins were included in the sample but were evaluated separately.

The children were from Florida, Georgia, Illinois, and Missouri. The criteria for selection were: availability, willingness to be tested, and a confirmed diagnosis of diabetes. Only those children who were overtly retarded or emotionally disturbed were excluded from the study.

Collection of Data

The Abstraction Data

The data on abstract or concrete thinking were obtained by using a thematic apperceptive technique, the Abstract Slide Test, which was designed to depict actions commonly stressed in the control of diabetes. The instrument, consisting of four colored slides, was tested on children attending camp in order to evaluate both the instrument and the classification system involved in scoring the instrument.

As a result of the testing, the classifications of abstract and concrete were more clearly defined, but no changes were made in the slide selection. In its final form, the situations portrayed were:

Slide 1. Physical Care

A man is examining a boy. He has both hands on the boy's neck.

Slide 2. Insulin

A boy standing outside a cabin has a syringe in his hand.

Slide 3. Diet

Three boys are standing beside a table that has food and dishes on it.

Slide 4. Urine Testing

A boy is holding a test tube at eye level and is looking at it. The tube has something orange in it.

The one by one inch slides were in full color and were seen through a small hand viewer. (See Appendix A for color reproductions of the Abstract Slide Test.) He was asked such questions as, "What is happening here?" No suggestions were given. No answers were approved

TABLE 1

DISTRIBUTION OF CHILDREN BY TEST, SEX, AND AGE

Test	Sex		Age							
	Boy	Girl	8	9	10	11	12	13	14	15
Abstract Slide Test	38	44	5	13	14	17	11	8	9	5
EFT only	12	15			3	5	8	8		3
EFT and AST	22	21		2	9	10	10	6		6
Total	72	80	5	15	26	32	29	22	9	14

TABLE 2

DISTRIBUTION OF CHILDREN TAKING EFT ACCORDING TO AGE, SEX, AND RACE

Age in Years	Sex		Race	
	Boy	Girl	Black	White
9	2			2
10	6	6	3	9
11	6	9	4	11
12	9	9	3	15
13	6	8	3	11
15	5	4	1	8
Total	34	36	14	56

or disapproved. The child was encouraged but in no way was he helped to answer. Responses were recorded verbatim by the investigator in long-hand.

Abstract responses

The responses to the Abstract Slide Test were scored for abstract or concrete content. If any ability to abstract was present, the response was judged to be abstract. No attempt was made to measure the degree of abstraction or concretion. The responses were either totally concrete or judged to be abstract.

Any hypothetical responses, or responses involving the future, or involving causality, or containing a means and ends focus were judged to be abstract. Completely concrete responses reflected none of these abilities and stressed details, external cues, the real rather than the potential, and were present-oriented.

Abstract scores

If the response to a slide was judged to be concrete, the score was zero. If the response was judged to be abstract, the score was one. The final test score was the total received on all four slides. The final score could range from zero (no abstraction on any slide) to four (all responses judged as abstract). (See Appendix B for sample responses and scoring.)

Inter-rater reliability

All responses were typed out on separate sheets of paper, one sheet for each slide. Many children gave basically the same responses to some slides and there was a total of 109 different responses to all

four slides. The judges were given the typed responses and the slides with viewer so they could see the slides just as the children had seen them.

The definitions of concrete and abstract as stated in this study were the criteria for judging the responses. The judges were all nurses, two had doctoral degrees in education, one had a master's degree in psychiatric nursing, one had a master's degree in pediatric nursing. Each judge worked independently. Overall, inter-rater reliability was .94 computed by means of chi-square, the mean square contingency, the coefficient of contingency and the correction for class index. (See Appendix C for reliability statistics.)

The Alienation Data

The Embedded Figures Test was a timed test of figure-ground differentiation. The test used consisted of two sets of cards: one set of twelve cards with complex figures, numbered in the order of presentation from one through twelve, and a set of eight cards with simple forms designated by letters A through H. On the back of each complex figure card there was printed the letter identifying the simple form embedded in the complex figure. The child had to find each simple figure and his score on the test was the total time in seconds required to find the twelve simple figures.

Each simple figure was presented to the child, followed by the complex figure in which it was embedded. He had three minutes to identify the simple figure by tracing it with a stylus or with his fingertip. He could ask, at any time, to see the simple figure again

and could see it as often as he wished. The time required to find and trace the figures was recorded in seconds for each of the twelve cards. His total score for the test was the sum of the solution times for all twelve items.

Many studies in the Sixties validated the concept that the EFT was a test of field-dependence in perception and that performance on the EFT reflected the extent of intellectual functioning as well. A child scoring high on the EFT would be less able to differentiate figure from ground, would be more influenced by external cues, and would be more alienated, as alienated has been defined in this study.

The Hospitalization Data

The number of times each child had been hospitalized in the last two years was recorded on his medical history. The number of days of school missed because of illness was also recorded but the figures were found to be inaccurate in some instances and in the final analysis could not be used. For instance, a child might be sick for two weeks during summer vacation and this would not be mentioned.

The number of hospitalizations ranged from none to fifty. However, each child was classified simply as hospitalized or non-hospitalized.

Treatment of Data

Hypothesis number one was tested with the Fisher Exact Probability Test to determine the difference in the proportion with which the two groups fell into the two classifications.

Hypotheses I and II were tested with the point biserial correlation coefficient to determine the significance of the relationships.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

When the possible relationships among abstract thinking, alienation and hospitalizations for children with diabetes were differentiated by sex, six hypotheses were formulated:

Hypothesis I	There will be no difference in the rate of hospitalization of girls who are alienated and girls who are not alienated.
Hypothesis II	There will be no difference in the rate of hospitalization of boys who are alienated and boys who are not alienated.
Hypothesis III	There will be no difference in the rate of hospitalization of girls who think abstractly and girls who think concretely.
Hypothesis IV	There will be no difference in the rate of hospitalization of boys who think abstractly and boys who think concretely.
Hypothesis V	There will be no relationship between the girls' scores on the embedded figures test and the abstract slide test.
Hypothesis VI	There will be no relationship between the boys' scores on the embedded figures test and the abstract slide test.

No hypotheses were made concerning race because of the small number of blacks, but the racial data were tabulated and recorded.

Analysis of the Data

The Alienation Data

The embedded figures test (EFT) was scored in seconds. The score for each child was the total number of seconds needed to find the

twelve simple figures on the cards. The maximum time allowed for each was three minutes. No child was forced to continue or to finish any card. Any child could give up at any time and go on to the next card. The score for an incompleted card was 180 seconds. The largest score possible for all twelve cards was 2160 seconds. The total scores obtained ranged from 120 seconds (for a 12-year-old boy) to 1858 seconds (for a 10-year-old girl).

Hospitalization rates were dichotomized into "hospitalized" and "not hospitalized." If a child had not been hospitalized during the previous two years, he was considered to be "not hospitalized" and received a score of 0. If a child was hospitalized one or more times, he was considered to be "hospitalized" and received a score of 1.

A point biserial correlation was done on each age group for each sex. Then a total correlation was done for all the boys and one for all the girls. Correlations were also obtained for all the black girls, all the white girls, all the black boys, and all the white boys without regard to age. Table 3 summarizes the results obtained.

At the .05 level of significance, Hypotheses I and II could be rejected for the total of 36 girls and for the total of 32 boys. There was also a significant difference recorded for the total of 29 white girls and for the total of 25 white boys. The 10- and 12-year-old boys showed a significant difference as did the 10- and 11-year-old girls.

Although the correlation was high, because of the small sample (7 boys and 7 girls) the black children showed no significant difference in the number of hospitalizations of those alienated and those not

TABLE 3

CORRELATION OF EFT SCORES AND HOSPITALIZATIONS
BY AGE, SEX, AND RACE

Age	Boys		Girls	
	N	r_{pb}	N	r_{pb}
10	6	.9319*	6	.8964*
11	6	.3195	9	.6701*
12	9	.8639*	9	.4072
13	6	.7215	8	.2955
15	5	.7438	4	.4934
Total	32	.6560*	36	.4062*
Black	7	.7571	7	.4489
White	25	.6855*	29	.4019*

*Significant at the .05 level.

alienated. There was also no significant difference found for the 11-, 13-, and 15-year-old boys or for the 12-, 13-, and 15-year-old girls.

At all age levels (except 11-year-olds) for either race, and in the total figures, the boys had higher correlations than the girls. The boys' lower scores and the greater range of their scores may have contributed to this.

The Abstraction Data

The responses to the abstract slide test (AST) were rated as abstract or concrete. A score of 0 (concrete) or 1 (abstract) was given for each slide. The total scores for the four slides could be 0, 1, 2, 3, or 4 depending upon how many slides were responded to abstractly. For statistical purposes, these scores were also dichotomized to 1 (abstract responses on 1, 2, 3, or 4 slides) or 0 (abstract responses on none of the slides).

A Fisher exact probability test was done for the total of girls and one for the total of boys in both the sample and in the original pilot group. The resultant four contingency tables are shown in Table 4.

The region of rejection was determined for each group at the .05 level. The AH quadrant (upper left corner of contingency table) contained the number of those scored as abstract who had been hospitalized. The other three quadrants contained the abstract and not hospitalized, and those scored as concrete who were hospitalized and those who were not hospitalized. Probabilities were done for the AH quadrant.

For the girls' pilot group the probability that AH would contain a 0 was .0002. The probability that it would contain a 0, 1, or 9 was .010. The hypothesis of no difference could be rejected.

TABLE 4

CONTINGENCY TABLES FOR AST SCORES AND HOSPITALIZATIONS BY SEX, FOR SAMPLE GROUP AND PILOT GROUP

Sample

Boys

	H	NH	
A	2	7	9
C	7	4	11
	9	11	20

Girls

	H	NH	
A	5	6	11
C	10	0	10
	15	6	21

Pilot

Boys

	H	NH	
A	0	10	10
C	17	11	28
	17	21	38

Girls

	H	NH	
A	0	9	9
C	24	11	35
	24	20	44

In the girls' later sample the probability of AH being 5 was .008, and the probability of it being 5 or more extreme was .012. The hypothesis could be rejected if AH contained 5 or 11.

In the boys' pilot study the probability of a 0 in AH was .001 and the probability of a 0, 1, 8, 9, or 10 was .013. The hypothesis of no difference could be rejected.

For the boys' later sample the probability of AH containing a 2 was .07 and the probability of a 2 or a more extreme score was 0.10. The hypothesis of no difference could be rejected if AH contained a 0, 1, 8, or 9. AH did not contain one of these numbers and rejection was not possible. However, the hypothesis of no difference could be accepted if AH contained a 2, 3, 4, 5, or 6. Hence, the hypothesis was not rejected.

The Test Comparison Data

A point biserial correlation was computed on each age group for each sex using the EFT scores and the dichotomized scores on the AST. The results are summarized in Table 5.

In no age group, for either black or white, boys or girls, were the correlations statistically significant. The hypothesis of no relationship could not be rejected. There apparently was no relationship between the levels of alienation and of abstraction.

In all instances except one the correlations were negative. For 15-year-old girls the correlation was positive but there were only two girls in this age group.

TABLE 5

CORRELATION OF EFT AND AST SCORES BY AGE, SEX, AND RACE*

Age	Boys N	Boys r_{pb}	Girls N	Girls r_{pb}
10	5	-.7598	4	-.3201
11	4	-.0466	6	-.5716
12	5	-.7655	5	-.6658
13	2	-.9999	4	-.8378
15	4	-.8093	2	+.9999
Total	20	-.1492	21	-.3559
Black	7	-.3456	7	-.4489
White	13	-.0339	14	-.3887

*Not statistically significant.

The EFT Data

The EFT data, taken alone and not in relationship to other variables in the study, were compared to the normative data of Witkin, who developed the test. The means for each age group and either sex established by Witkin (35:6) were compared to the means obtained for the children in the study. The figures are summarized in Table 6.

There were only four 15-year-old girls and two of them refused to work with any figure more than 25 seconds, thereby increasing their scores. These girls scored above the norm in all four areas.

The means for boys in all age groups were below the norm for those boys considered abstract and those who had not been hospitalized. No such clear-cut situation existed for those boys who were hospitalized or who were concrete thinkers; their means varied with age.

Whether the group means were above or below the age norm, in all groups except one, those who were hospitalized scored higher than those who were not hospitalized and those who were abstract scored lower than those who were concrete. The 15-year-old girls judged as abstract had larger scores than those judged as concrete.

When the totals for each age group were noted by sex, other differences were noticeable. The totals are summarized in Table 7.

With the exception of 12-year-old boys whose mean was higher than the mean for 11-year-old boys, the mean norms decreased with age for both sexes, with a noticeable drop at the 13-year-old level. At all ages the boys' means were lower than the girls'.

TABLE 6

MEANS ON EFT COMPARED TO MEAN NORMS BY AGE, SEX, ABSTRACT/CONCRETE AND HOSPITALIZED/ NOT HOSPITALIZED CATEGORIES

Age	EFT		Mean Norms	EFT	
	Hosp.	Not Hosp.		Abstract	Concrete
			Boys		
10	1460	1043	1414	1151	1474
11	1102	915	1120	882	903
12*	1075	444	1137	300	938
13	914	474	712	384	876
15	620	376	416	239	422
			Girls		
10	1640	1032	1533	1625	1705
11	1427	1163	1341	1283	1433
12*	926	608	1261	552	873
13	1028	842	881	497	1211
15	911	823	565	1020	867

*Below the norm in all four areas.

TABLE 7

MEANS OF EFT SCORES COMPARED WITH MEAN NORMS BY AGE AND SEX

Age	EFT Boys	Norms Boys	Norms Girls	EFT Girls
10	1304	1414	1522	1539
11	1008	1120	1341	1338
12	705	1137	1261	822
13	694	712	881	930
15	425	416	565	889

For the children tested the boys' means decreased with age, the girls' means decreased with age with the exception of the 12-year-old group whose scores were the lowest. There was a noticeable drop at the 12-year level rather than at the 13-year-old level of the normative data. At all ages the means for boys were lower than the means for girls.

Because there were no norms available for chronically ill children and it was not logical to compare these two groups (the norm data and the study data) statistically, no further computations were done with these figures. The data were included as a possible source of further research material.

Interpretation of Data

Limitations of the Study

Any interpretation of the data had to be done within the limits imposed by the study. No attempt was made to investigate the reasons for the presence of alienation or concrete thinking in the children. It was simply ascertained if these variables existed differentially when comparing children who had been hospitalized for diabetes to children who had not been hospitalized for diabetes during the preceding two years.

The children could not be selected at random. Selecting from those who were willing and available may have inserted some degree of bias into the findings.

No exact figures existed describing the population of children with diabetes. There was, therefore, no way of knowing how representative the sample was. Girls comprised approximately 51 percent of the sample,

boys 49 percent. Of the sample 20 percent were black, 80 percent were white. Whether or not this was close to their proper representation in the population was not ascertainable.

The difficulty in obtaining larger numbers of black participants restricted the analyses and interpretation of data obtained on the black children.

The norms for the EFT were not obtained by using children with diabetes and perhaps children with diabetes would have had very different norms. The means of the sample might have compared quite differently with norms established for children with diabetes.

Many of the children in the study had been subjected to other tests during their stay at camp and might have reacted differently to the testing situation under other conditions.

One person did all of the testing and this also may have inserted a degree of bias. However, no information about the hospitalization records was obtained until after the testing was completed to prevent bias in this way.

Many of the children studied did not identify all of the figures in the EFT and therefore received the full three-minute scores for one or several cards. This repeated failure to complete the cards may or may not have affected the results. It was a possible limitation.

The Pilot Group

Only the AST was tested on the pilot group. In analyzing the data, the hypotheses of no difference were rejected for both boys and girls. There did seem to be a definite difference in the number of

children hospitalized when those evaluated as abstract were compared with those evaluated as concrete. None of the children in the abstract group had been hospitalized, although 65 percent of the concrete group had been hospitalized. The pilot data, taken alone, seemed to indicate that those children who thought abstractly were more predictable than those who thought concretely. All of the abstract children followed the expected pattern of behavior and remained not hospitalized. Of the concrete thinkers, 35 percent behaved in a reverse manner and were not hospitalized, while 65 percent behaved as expected and were hospitalized.

The Study Group

In all age groups, for either sex (with the exception of 15-year-old girls) the abstract thinkers had smaller scores on the EFT than the concrete thinkers. The hospitalized children had larger scores than the not hospitalized. This seemed to indicate that the abstract thinkers and those not hospitalized were more differentiated and less distracted by external cues than were the concrete thinkers and the hospitalized children.

The differences were apparently not related to sex, although boys have usually scored lower on the EFT than girls have. The boys' scores were more highly correlated with their hospitalization record than the girls' scores were. Both sexes showed a significant difference in the EFT scores for the hospitalized and the not hospitalized.

The relationship was more apparent in the younger age groups. This may have been due to the increased ability to differentiate with age. Or it may have been that the younger children were hospitalized

more often than the older children for disturbances in their diabetes which might have been equal in degree but considered more serious in the younger age group.

The black children showed no statistically significant difference between the hospitalized and not hospitalized on the EFT. For both sexes the correlations for the black children were larger than for the white, but the sample was too small to be significant.

For all groups except the 15-year-old girls, there was a negative correlation between the EFT scores and the AST scores. There were only two girls of this age so it was not possible to interpret their positive correlation as an indication of their group in the population.

In theory, the more abstract the child was, the more differentiated he was expected to be. This was the result in all except one group. The differences were not significant, however, and the hypotheses of no difference could not be rejected.

Perhaps the tests were not sufficiently different. Perhaps differentiation and abstraction overlapped too much to be accurately tested. The negative correlations did suggest some relationship existed.

The abstraction data taken alone for the group showed mixed results. For the girls, all the concrete thinkers had been hospitalized. Of the abstract thinkers, however, 45 percent had also been hospitalized. There was a significant difference between the two groups and it would seem that, for the girls, the concrete thinkers were more predictable than the abstract thinkers. This was the exact opposite of the pilot group. The boys were less predictable. Almost 20 percent of the

abstract thinkers had been hospitalized, and more than 30 percent of the concrete thinkers had not. Of the total group 30 percent of the boys did the reverse of what was expected. Of the girls, 25 percent did the reverse in both the pilot and study groups. In the pilot group 26 percent of the boys did the reverse. In three out of four of the groups, the expected relationship occurred 75 percent of the time and these results were significant. For the boys in the study group the expected relationship occurred only 70 percent of the time and this was not significant. The boys' results were inconclusive and perhaps they were merely more unpredictable as a group. It was also possible that some differential level of abstraction existed that the instrument was not sensitive enough to measure. Concrete thinking may have been a more effective predictor for girls than boys.

More girls than boys were hospitalized. Although the abstract thinkers in the girls' sample outnumbered the concrete 11 to 10, the concrete thinkers were hospitalized twice as often (10 to 5) as the abstract thinkers. For the boys, concrete thinkers outnumbered the abstract 11 to 9, but the concrete thinkers were hospitalized more than three times as often (7 to 2). Although not statistically significant, the boys' results could be interpreted as of a practical significance. A group of diabetic children who were hospitalized more than three times as often as another group would bear further investigation.

The Identical Twins

The twins who were tested were treated separately for two reasons: they were only nine years old, and they were identical twins.

The boys were tested in the same way as the other children. Twin A had been hospitalized in infancy at which time he was diagnosed as diabetic. He was hospitalized once after that for a diabetic problem. Twin B had never been hospitalized even for diagnosis. Their data are summarized in Table 8.

TABLE 8

DATA FOR IDENTICAL 9-YEAR-OLD TWINS ON THE EFT, AST, AND HOSPITALIZATIONS

Twin	EFT	AST	Hospitalization
A	1512	C	1
B	927	A	0

Their data were perfectly correlated but, with only one set of twins, not statistically significant. They may have behaved as expected purely by chance. There was nothing in their medical histories to suggest any difference in the degree or severity of their diabetes. The one major difference in their background was twin A's early hospitalization. Perhaps this early hospitalization may have affected him in such a way that he was not able to differentiate or abstract as soon as his brother.

Summary

Sixty-eight children with diabetes, ranging in age from 10 to 15 were tested with the embedded figures test (EFT) to ascertain the degree of alienation. Forty-one were tested with the abstract slide test (AST) to determine their ability in abstract thinking. The tests results were correlated with the rate of hospitalization by age, sex, and race.

Point biserial correlations of the EFT and hospitalizations were statistically significant at the .05 level for the total group of boys and the total group of girls. The hypotheses of no difference in rate of hospitalization of the alienated and not alienated could be rejected. The correlations were not significant for the black or older age groups, were significant for the white children and younger age groups, but no hypotheses had been made concerning age or race

The Fisher exact probability test on the results of the AST and hospitalizations was statistically significant for girls at the .05 level, but not for boys. The hypothesis of no difference in rate of hospitalization of the abstract and concrete thinkers could be rejected for girls but not for boys.

In comparing tests, a point biserial correlation showed no statistically significant correlations by age, sex, or race. The hypothesis of no relationship could not be rejected for either sex.

CHAPTER V

SUMMARY, CONCLUSIONS AND IMPLICATIONS

Summary

Purpose of the Study

The purpose of this study was to test the hypothesis that diabetic children who have repeated problems in controlling their disease are more concrete and alienated in their thinking than are children with diabetes who do not have these problems with their disease.

Definition of Terms

For the purposes of this study the following definitions were used:

Alienation.--Self-estrangement to the degree that behavior depends upon future rewards, or upon rewards that are not a part of the behavior itself, or upon external rewards.

Concrete.--Thinking that is present-oriented and guided by external cues, by inability to anticipate, to understand cause and effect, or to differentiate figure from ground.

Abstract.--Thinking that is future-oriented and guided by hypothetical or deductive reasoning, by internal cues, by an ability to anticipate, to deal with potentials, to understand cause and effect, and to differentiate figure from ground.

Controlled diabetes.--Not hospitalized during the two years preceding the study for diabetic problems arising from failure to follow recommended practices of diabetic management.

Questions for Study

This study sought to find answers to the following questions:

1. Is there a difference in the level of concrete thinking in children with poorly controlled diabetes?

2. Is there a difference in the amount of external control these children believe in?

3. Can testing yield significant differences between well-controlled and poorly controlled diabetic children?

Need for the Study

There was a need to investigate the relationship of a child's thinking (not his intelligence) and his handling of illness. Awareness of such a relationship could enable nurses to formulate different nursing programs for the ill child. Awareness of such a relationship could enable teachers to formulate a different curriculum for teaching the care of the ill child.

Design of the Study

This study was designed to explore the relationship between thinking and alienation in children with diabetes and the children's record of hospitalizations.

The participants

One hundred and fifty-two children were involved in this study, ranging in age from 8 through 15 years. Eighty-two of them served as a pilot study for the development of the Abstract Slide Test (AST). Seventy of the children received the Embedded Figures Test (EFT). Of these 70, 27 received only the EFT, the remaining 43 received both the EFT and AST.

The children were from 4 states, 30 of them had never attended a camp for children with diabetes, 122 of them had. There were 32 boys and 36 girls in the sample, 14 were black and 54 were white. The pilot group of 72 boys and 80 girls were treated separately as were one pair of 9-year-old identical twins in the study.

The abstraction data

The data on abstract or concrete thinking were obtained with the AST, designed to depict actions commonly stressed in teaching about diabetes. Four colored slides portraying (1) physical care, (2) insulin, (3) diet, and (4) urine testing were seen through a small hand viewer. Each response to such questions as "What is happening here?" was recorded and scored by four raters according to the definitions of abstract and concrete used in the study. A concrete answer received a 0, and an abstract answer recieved a 1. Inter-rater reliability for the test was .94 computed by means of the contingency coefficient.

The alienation data

The alienation data were obtained with the EFT, a timed test of figure-ground differentiation. There were 12 cards, in the test, each

showing a complex geometric figure which contained a simple geometric figure embedded within it. Each child had three minutes per card to identify the simple figure.

The time required to identify the simple figure was recorded in seconds. The child's total score was the sum of the seconds needed to complete all of the 12 cards.

The hospitalization data

The hospitalization data were obtained by checking each child's medical history for the past two years. If he had not been hospitalized his score was 0; if he had been hospitalized one or more times his score was 1.

Analysis and Interpretation of Data

When the possible relationships between hospitalization, alienation, and abstract thinking were differentiated by sex, six hypotheses were formulated:

Hypothesis I	There will be no difference in the rate of hospitalization of girls who are alienated and girls who are not alienated.
Hypothesis II	There will be no difference in the rate of hospitalization of boys who are alienated and boys who are not alienated.
Hypothesis III	There will be no difference in the rate of hospitalization of girls who think abstractly and girls who think concretely.
Hypothesis IV	There will be no difference in the rate of hospitalization of boys who think abstractly and boys who think concretely.
Hypothesis V	There will be no relationship between the girls' scores on the embedded figures test and the abstract slide test.

Hypothesis VI There will be no relationship between the boys' scores on the embedded figures test and the abstract slide test.

No hypotheses were made concerning race or age because of the small number of children in each group, but the data on race and age were tabulated and recorded.

Hypotheses I and II were tested with the Fisher exact probability test. Hypotheses III, IV, V, and VI were tested with a point biserial correlation coefficient.

The responses to the AST were dichotomized into "abstract" or "concrete." If a child had concrete responses to all four slides, he was judged as concrete and received a score of 0. If he had abstract responses to any or all of the slides he was judged as abstract and his score was 1.

Point biserial correlations for the total boys' sample and the total girls' sample were significant at the .05 level and Hypotheses I and II could be rejected. There was a difference in hospitalization for those children who were alienated and for those who were not alienated.

The Fisher exact probability test on the total of girls and the total of boys in the pilot group and the sample yielded significant results in three out of four of the groups at the .05 level. Hypothesis III could be rejected for both the pilot and sample groups. Hypothesis IV could be rejected for the pilot group but not for the sample group. Hypothesis IV was not rejected.

A point biserial correlation computed for the EFT and AST scores showed no statistically significant correlations for either sex. There apparently was no relationship between the levels of abstraction and of alienation. Hypotheses V and VI could not be rejected.

The EFT data were also compared with the normative EFT data of Witkin (36:6). The study means were compared to Witkin's means for either sex, in each age group, for the abstract/concrete and hospitalized/not hospitalized groups.

In the study group the 12-year-olds scored below the mean in all four groups for each sex. The 15-year-old girls scored above the mean in all four groups.

Except for the 15-year-old girls, the hospitalized and the concrete groups had higher EFT means than the not hospitalized and the abstract groups.

The Witkin means showed a marked change between 12 and 13 years of age. The means of the children in the study showed the same type of change between 11 and 12 years of age, a full year earlier. For all ages, the means of boys were lower than the means of girls.

Many of the children did not identify all the figures in the EFT and received the full three-minute scores for one or several of the 12 cards. This repeated failure to complete the cards may have affected the results.

In theory, the more abstract children were expected to be more differentiated and less often hospitalized. The more concrete children were expected to be less differentiated and more often hospitalized. Of the girls, 75 percent did the expected in relationship to the abstract/concrete dimension and hospitalization, 70 percent of the boys did the expected in this area. For the boys all the concrete thinkers were less differentiated than the abstract thinkers. For the girls, all the

concrete thinkers (except the 15-year-old) were less differentiated than the abstract thinkers. Statistically, however, only the girls' abstract/concrete, hospitalized/not hospitalized correlations were significant at the .05 level.

The 9-year-old identical twins performed exactly as expected in all categories: one twin was abstract, highly differentiated, and not hospitalized; the other twin was concrete, less differentiated, and hospitalized twice.

Conclusions

The results of the study warrant the following conclusions:

1. It is possible to measure alienation and abstraction in children with diabetes.

2. Abstraction and differentiation overlap but are not the same.

3. Boys differ from girls in levels of abstraction and alienation.

4. The relationship between concrete thinking and hospitalization may be more evident in girls than in boys.

5. The hospitalized children are more concrete and more externally controlled.

6. Abstract thinkers and the less alienated are hospitalized less frequently than the concrete thinkers and the more alienated.

7. It is possible to predict which children will have problems controlling their diabetes from their abstraction and/or alienation levels.

Implications

Basic to this study were two assumptions. The first assumption was that a difference existed between children with diabetes who were hospitalized and children with diabetes who were not hospitalized, a difference that affected the rate of hospitalization.

The second assumption was that this difference involved the levels of abstract thinking and of alienation in the children, and that this difference could be measured.

From the data obtained and the conclusions drawn some implications can be made.

Nursing Implications

1. Since it is possible to predict which children may have difficulties, preventive measures can be devised to reach these children. These measures may already be available but not recognized.

2. If the thinking differences are recognized, the children who think concretely will not be assumed to understand or to react to knowledge the same way the abstract children do. Knowledge about diabetes and self-care will be viewed as meaning different things to these children. A concrete child will not be considered to have as thorough a grasp of cause and effect, of alternatives, or of future happenings as his abstract brother, even though the knowledge or information they possess is the same.

3. If the alienated child is more often hospitalized, then efforts could be made to help him become less alienated. The more dependent the behavior is on rewards outside the activity itself, the

greater the alienation. Therefore, the child might become less alienated if he were praised for doing the necessary things in relationship to his own health, his own needs, his own future; instead of being praised for being good and obeying the nurse, the doctor, the parents.

4. Alienation is increased with more external control, real or imagined. The Russian method of teaching obedience rather than independence can increase such alienation. The teaching of obedience by punishment or withdrawal of love will compound the problem. Disapproval has an unfortunate effect upon the alienated individual. The alienated, or field-dependent, children are more dependent upon external (especially adult) opinions to define themselves. When these opinions are adverse, the child's opinion of himself is lowered. On the other hand, such children try to please others because they are dependent upon them. It becomes a circular bind, with the alienated child seeking approval and then, whether rebuffed or praised, seeking more approval. In either event, the alienation and external orientation is reinforced. Such children need to be accepted as they are, for themselves, and rewarded for the actions they take which increase their internal control, and neither punished nor rewarded for actions which increase their external orientation.

5. Many things may affect the development of abstraction and differentiation in children. If concrete thinking and alienation influence the tendencies to be hospitalized, perhaps early hospitalization may also reinforce concrete thinking and alienation. Any hospitalization may increase the tendency to be hospitalized by reinforcing the need for external approval and rewarding present-oriented behavior.

Teaching Implications

1. Externally oriented teachers can reinforce alienated nurses who reinforce a child's alienation.

2. Different approaches are used to develop abstract thinking than are used to develop concrete thinking. Concrete thinking is developmental but abstraction is more environmental. Present-oriented studies do not increase abstraction ability.

3. Teachers, and/or nurses, who work with concrete thinkers have different reactions. Sometimes abstract thinkers lose patience with those who are more concrete. But concrete thinkers merely reinforce the concreteness and do not help develop the abstraction dimension. The child who thinks concretely (as well as the nursing student who thinks concretely) loses in either case.

4. The externally oriented teacher or nurse is not usually able to develop internally oriented students, or to help children become less dependent upon external cues. External rewards need to be "internalized" in some way. This way would seem to be the way of independence, acceptance, and support, rather than obedience, conformity, and external rewards.

Research Implications

1. The figures available for the population of children with diabetes are not definitive. A nationwide survey by Public Health Departments, or government bureaus, is needed as a base for further study in this area.

2. The Abstract Slide Test was statistically significant for three out of four groups. With a larger sample, the fourth group might also have been significant. Further research with larger samples could be productive.

3. More experimental research is needed in the area of thinking and alienation. Knowledge about his disease is not as important as how the child with diabetes views himself and his diabetes and his future. The concrete and externally oriented child may know as much as the abstract and internally oriented, but they use their information differently. If more information could be obtained on the differences in the way these two groups use their knowledge, different teaching techniques could be devised to develop each group (but especially the concrete, externally oriented group) to its fullest potential. Without this information it is difficult to tell how much some of these children actually relate their knowledge to themselves. Since it is not always possible to develop abstract ability in any given child at any given time, it is necessary to know how to teach him as he is. To do this, it is necessary to know how he is thinking.

4. Research with other chronically ill children, using the thinking and alienation measures, might result in useful findings. Many of the children in the study failed to finish one or more of the EFT cards. They seemed to lose patience easily. If such findings were present in studies of other chronically ill children, they could be important in helping these children live with their disease. Lack of patience is an unfortunate trait for a chronically ill child to develop, and he needs help to overcome this.

5. Research with older age groups, using the alienation and concrete thinking measures, might also result in useful findings. Many adults, of all ages, are concrete and externally oriented. It is possible that the hospitalization records of adults could resemble the records of the children when measured against these thinking dimensions. If this were the case, teaching procedures could be revised to take ways of thinking into account for adults also. Perhaps their hospitalization records could be improved, and their overall health and future welfare as well.

APPENDICES

APPENDIX A

ABSTRACT SLIDE TEST REPRODUCTIONS

Slide I

Slide II

Slide III

Slide IV

APPENDIX B

SAMPLE TEST RESPONSES AND SCORING

Slide I

Abstract

1. Doctor checking a kid to see what's wrong with him. Mother thought he was sick so she took him to the doctor. What happens depends on what the doctor finds.

2. Doctor checking boy in camp infirmary. Boxes, syringes, cup. Boy sitting on the bed. He may be going into a reaction and will have to have glucogon.

3. Testing his tonsils--his glands. He has a sore throat. He'll get penicillin, pills, and have to watch out for the rain.

4. Doctor giving a boy a physical. Probably a diabetic, needs checking.

Concrete

1. Doctor examining a boy in a swim suit.

2. Man and a little boy. Doctor giving him a "watchamajigger" in the infirmary.

3. Man feeling a boy.

4. Man trying to choke a boy.

5. A boy with just his pants on and a man looking in his face.

6. He's got his hands up to the kid's throat. Don't know what purpose it serves.

Slide II

Abstract

1. Boy drawing up insulin. He has diabetes. The shot will keep him through the day.

2. Drawing out insulin. Gave himself a shot because he's diabetic.

3. Doesn't look as though he had trouble with diabetes. He's drawing out insulin to take it and stay well.

Concrete

1. Doing his insulin.

2. Syringe and insulin--going to give himself a shot. Pulling out of bottle.

3. Giving his shot.

Slide III

Abstract

1. Campers standing up before meal. Probably an announcement to be made. It's a healthy meal. They all look pretty decent.

2. Lunch, boys, counselors, one boy is walking, one boy has something in his hand. They are getting ready to say a blessing. Will eat and then go out to play.

3. Breakfast, gallon of milk, carton of milk. Not breakfast, dinner because there's cheese on the table. Each one of them should have at least one glass of milk. A little boy is holding his elbow. The shot probably hurt him.

Concrete

1. Bread, cups, dishes, milk, meat, cheese.

2. Lunch time, milk, mustard, bread, meat, dishes.

3. Cabin getting ready to eat. Tray, food, windows--everybody standing.

Slide IV

Abstract

1. Testing urine, heavy in sugar, hasn't been exercising. Maybe too much insulin or too much food (an error here but still quite abstract).

2. Testing his urine. Turned out pretty high. He hasn't been watching his diet or exercising right.

3. Boy testing urine to see how high it is. If he didn't he might get sick before he knew it.

4. Testing his urine so his doctor knows what to do.

5. Checking his urine to see how much sugar in the blood (!) and how much insulin he should take.

6. Tested his urine. It was 5%. He'd better get a nurse.

Concrete

1. Five percent in his urine--because it's orange.

2. High in sugar because it's orange.

3. Boy checking urine to see what it tests.

APPENDIX C

INTER-RATER RELIABILITY

The inter-rater reliability was based upon the probability with which each rater judged the 199 responses as abstract.

Rater	P (abstract)	Q (not abstract)
1	.2752	.7248
2	.3211	.6789
3	.2294	.7706
4	.1743	.8257

The expected and observed frequencies of all four raters agreeing on abstraction, of three raters agreeing on abstraction, of an even split between abstraction and no abstraction, of one rater judging abstraction, and of no raters judging abstraction were as follows:

No. of raters	E	O
4	.3851	18.0000
3	4.9511	2.0000
2	23.0766	12.0000
1	46.4623	7.0000
0	34.1273	70.0000

resulting in a chi-square of 884.40. This indicated that such a wide departure from the expected frequencies would occur by chance less than once in 100 times. It showed a significant lack of independence between the raters but did not show the strength of the dependence.

In order to obtain some measure of the strength of the correlation, a coefficient comparable to the Pearson correlation coefficient was derived from the mean square contingency.

The mean square contingency of 8.11 (chi-square/N) when divided by itself plus one (8.11/9.11) yielded .8902, the square root of which was the mean square coefficient of .94.

Because grouping may result in reduced correlations, a correction for class index was made using Kelley's table. The correction was minimal and the final correlation of inter-rater reliability was .94 (9:359).

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Dorris Brooks Payne was born in Illinois. She received a Bachelor of Science in Nursing degree from Northern Illinois University and worked as an instructor in psychiatric nursing.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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Vynce A. Hines, Chairman
Professor of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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